Mobility and Mode Choice of People of Color for Non-Work Travel

Findings from the Nationwide Personal Transportation Surveys

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ABSTRACT

Mobility and Mode Choice of People of Color for Non-Work Travel:
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This paper endeavors to contribute to the body of knowledge on travel behavior through a comprehensive look at mobility and the mode choice behavior of people of color for their non-work travel. Travel by people of color is of strong policy interest because it is a growing and changing share of the total travel market and is expected to continue to grow much faster than overall travel well into the next century. The Nationwide Personal Transportation Survey (NPTS) provides a valuable data source for exploring these issues.

Understanding non-work travel is becoming increasingly important due to its growing influence people's lives and the transportation system. Non-work travel includes travel for personal and family business, school activities, religious activities, health care, and social and recreational activities. Work trip travel has declined to about 20 percent of all local travel. Even during traditional commuting rush periods, non-work travel comprises more than 70 percent of all trips. The resultant changes in both temporal and spatial distributions of travel in our metropolitan areas influence the types of transportation investments, services, and policies that can be used to address travel needs.

Mode choice determines how people travel and is an important part of travel behavior. This paper considers six mode choice options: driving privately-operated vehicles, riding in privately-operated vehicles as passengers, public transit, bicycle, walking, and others. This paper compares modal differences across groups by examining how patterns of difference in mode choice vary with personal, household, geographic, and trip characteristics. The exhaustive analysis examines a variety of distributions and tabulations and uses logistic regression to further explore mode choice differences between racial/ethnic groups.

The analysis indicates that the differences in non-work travel behavior for the various racial/ethnic groups has changed dramatically with minority travel behavior more closely matching mean behaviors. Mobility for minority travelers has increased and mode choice behavior, while still different, more closely resembles that of the aggregate population. Variations in aggregate group behavior can almost always be explained by socio-economic and geographic conditions. The most significant race/ethnicity-based difference appears to be a greater use of public transit by the Black population even when socio-economic characteristics of travelers are taken into accounted.

Key Words: Mode choice, People of Color, Minorities, Non-work travel, Blacks, Hispanics, Asians, travel behavior, Nationwide Personal Transportation Survey

Study Focus and Methodology

Study Purpose

The transportation planning community is best prepared to help in meeting the needs of travelers when they have a strong knowledge base on travel behavior. Transportation investments in facilities and services can be most wisely planned and issues such as future transportation demand, impacts, and equity, best addressed in the context of a rich understanding of travel behavior. This paper endeavors to contribute to the body of knowledge on travel behavior through a comprehensive look at mobility and the mode choice behavior of people of color for their non-work travel.

A broad understanding of travel behavior involves knowledge of many aspects, including why, when, and how people travel, how frequently, far, and fast people travel; and how these aspects vary with time, geography, and the demographic characteristics of the population. The Nationwide Personal Transportation Survey (NPTS) provides a valuable data source for exploring these issues. The analysis reported on in this paper presents a focused review of a particularly interesting component of travel behavior.

Travel by people of color is of strong policy interest because it is a growing and changing share of the total travel market and is expected to continue to grow much faster than overall travel well into the next century. This growth has been driven both by the growth in minority population and by the significant increases in travel rates by minority individuals. The travel behavior of this population segment is also changing rapidly with significant changes in mode choice. Another reason for the high interest in travel behavior of minority populations is the fact that mobility is essential to the quality of life and economic well-being of all people and minority populations historically have not had the same high level of mobility enjoyed by Whites in this country. Thus, understanding travel behavior for minorities also enables policy makers to explore the role that transportation may be playing in influencing the economic opportunity and

quality of life of the minority population.

Understanding non-work travel is becoming increasingly important due to its growing influence on people's lives and the transportation system. Non-work travel includes travel for personal and family business, school activities, religious activities, health care, social and recreational activities, and any other activities not related to commuting or work. From 1969 to 1995, work travel's share continued its declined from more than 26 percent to about 20 percent of all local travel.[1] Although work travel was growing substantially during this period, non-work travel was growing even more dramatically. Even during traditional commuting rush periods, non-work travel comprises more than 70 percent of all trips. The large share and fast growth of non-work travel have important implications to transportation planning. The resultant changes in both temporal and spatial distributions of travel in our metropolitan areas influence the types of investments, services, and policies that can be used to address travel needs.

Mode choice determines how people travel and is an important part of travel behavior. This paper considers six mode choice options: driving privately-operated vehicles, riding in privately-operated vehicles as passengers, public transit, bicycle, walking, and others.[2] This paper compares modal differences across groups by examining how patterns of difference in mode choice vary with personal, household, geographic, and trip characteristics. For each age cohort selected, for example, the analysis examines whether the pattern of modal differences among these racial and ethnic groups differs, both qualitatively and quantitatively, from the general pattern observed at the aggregate level. The paper also explores which of these characteristics may be largely responsible for the modal differences observed at the aggregate level across racial and ethnic groups. Finally, the paper reports on an investigation of the role of racial and

[1] The 1969 number is derived from Hu, Patricia S., and Jennifer Young (1993), *1990 NPTS Databook*, Washington, D.C.: FHWA, while that for 1995 is computed from the 1995 NPTS by the authors.

[2] Privately-operated vehicles mean motor vehicles that are privately owned and operated, including automobiles, vans, sports utility vehicles, pickup trucks, other trucks, recreational vehicles, motorcycles, and others. Public transit includes bus, commuter train, streetcar/trolley, and subway/elevated rail. School bus is included in the "others."

ethnic background in whether public transit is used for non-work travel by simultaneously controlling for many of the personal, household, geographic, and trip characteristics examined earlier.

For people of color, historically, many of their characteristics limited them from having the high level of mobility provided by the automobile. First, larger proportions of people of color live in households with low levels of income. Hispanic and Black household incomes are only 74 and 70 percent of the national average in 1995, respectively. Reasons for such income disparities include: people of color are younger on average, have lower levels of education attainment, and are more likely to live in single-adult households with children. People of color spend fewer dollars but larger shares of their income on transportation. Second, fewer people of color age 16 or older are licensed drivers. Third, people of color live in households with fewer vehicles; for example, about 20 percent of Blacks live in households without vehicles while only 3 percent of Whites live in one-vehicle households.

People may use transit and non-motorized modes to compensate for their lower mobility by the automobile. When people perceive one means of transportation to be too costly or unavailable for them, they may use other means even if the quality is lower. As a result some people may spend more time to achieve a given level of mobility at lower levels of comfort, reliability, security, and safety than the rest of the population. While such substitution may occur anywhere, it is made easier in large metropolitan areas or areas with high densities, where people of color are more likely to live than the rest of the population. Transit services are better in terms of spatial and temporal coverage in larger areas and in areas with higher densities. Additionally, destinations are more accessible by non-motorized modes in areas with high densities.

Background

To set the context for this analysis of mode choice for non-work travel, this research initiative reviewed the growth and composition of the population of people of color and their mobility levels. The

review of mobility levels looked at differences among racial and ethnic groups in the level of mobility for non-work activities from 1983 to 1995. The purpose was to examine the extent of disparities in mobility across racial and ethnic groups and how disparities may have changed during the period. The review also looked at major determinants of mobility and characteristics of people of color that may limit them from achieving high levels of mobility.

The literature offers little on non-work travel by people of color, in general, and mode choice by people of color for non-work travel, in particular. However, several branches of the literature offer some relevance to the subject of this document. The literature on non-work travel, in general, discusses how non-work travel may be modeled.[3] Other research focuses on the effect of land use patterns, especially neighborhood design, on mode choice and trip generation of non-work travel.[4] Another area is the literature on the analysis of non-work travel using household surveys.[5] None of the research based on household surveys focuses specifically on people of color. Some of it, however, does include racial and ethnic

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[3] Adler, Thomas Jay (1976), *Modeling Non-Work Travel Patterns*, Unpublished Ph.D. Dissertation, Department of Civil Engineering, Massachusetts Institute of Technology. Comsis Corp. (1977), *Refinement of San Diego Region Mode Split Models for the Non-Work Trip Purposes: Final Report*, Mountain View, California. Horowitz, Joel (1978), "A Disaggregate Demand Model for Non-Work Travel that Includes Multi-Destination Travel," Paper prepared for presentation at the 57th Annual Meeting of the Transportation Research Board. United States Environmental Protection Agency. Purvis, Charles L. (1996), "Incorporating Work Trip Accessibility in Nonwork Trip Generation Models in San Francisco Bay Area," *Transportation Research Record* 1556: 37-45.

[4] Handy, Susan (1993), "Regional versus Local Accessibility: Implications for Nonwork Travel," *Transportation Research Record* 1400: 101-107. Seubert, Matthew John (1996), *Residential Neighborhoods and Modal Splits in Non-Work Travel*, Thesis, Department of city and Regional Planning, University of California at Berkeley. Young, Elizabeth Gene (1997), *An Examination and Comparison of Non-Work Travel in Mixed Use and Typical Urbanized Neighborhoods*, Thesis, University of Washington. Boarnet, Marlon G., and Sharon Sarmiento (1998), "Can Land-Use Policy Really Affect Travel Behavior? A Study of the Link between Non-Work Travel and Land-Use Characteristics," *Urban Studies* 35: 1155-69.

[5] Pucher, John, and Fred Williams (1992), "Socioeconomic Characteristics of Urban Travelers: Evidence from the 1990-91 NPTS," *Transportation Quarterly* 46: 561-81. Taylor, Brian, and Michael Mauch (1997), "Gender, Race, and Travel Behavior: An Analysis of Household-Serving Travel and Commuting in the San Francisco Bay Area," Women's Transportation Conference, Baltimore, Maryland, circa 1997. Lockwood, Philomena Byrne (1993), *Non-Work Travel: A Study of Changing Behavior*, Thesis, University of Virginia.

background in the analysis.[6] Other research focuses on the importance of non-work travel or the relationship between work and non-work travel.[7]

Data

The primary data source for this work is the 1995 Nationwide Personal Transportation Survey for the mode choice analysis and the 1983, 1990, and 1995 Nationwide Personal Transportation Surveys for the trend analysis.[8] These are the latest three in a series of five surveys since 1969 conducted for the U.S. Department of Transportation. These surveys contain the most comprehensive data available on person travel throughout the nation. However, as when using any sample survey, the reader is encouraged to understand characteristics of the data that may influence the interpretation or degree of confidence in the findings. The nature of the data, changes between the surveys, and adaptations to minimize the impacts are discussed in detail in a technical report on which this paper is based.[9]

People of Color

[6] For example, Pucher, John, and Fred Williams (1992), "Socioeconomic Characteristics of Urban Travelers: Evidence from the 1990-91 NPTS," *Transportation Quarterly* 46: 561-81.

[7] Richardson, Harry Ward (1989), "Counting Nonwork Trips: the Missing Link in Transportation, Land Use, and Urban Policy," *Urban Land* 48: 6-12. Bhat, Chandra R. (1997), "Work Travel Mode Choice and Number of Non-Work Commute Stops," *Transportation Research-B* 31: 41-54.

[8] Data files from the 1983 and 1990 surveys are contained in a CD-ROM available from the Bureau of Transportation Statistics, U.S. Department of Transportation: *Nationwide Personal Transportation Survey: 1983 and 1990*, BTS-CD-09. Data files from the 1995 survey are available at the following web site: www-cta-ornl.gov/npts. Documentation for the 1983 survey is *User's Guide for the Public Use Tapes: 1983-1984 Nationwide Personal Transportation Study*, U.S. Department of Transportation (1985). Documentation for the 1990 survey is in *User's Guide for the Public Use Tapes: 1990 Nationwide Personal Transportation Survey* (1991). Documentation for the 1995 survey is at the web site listed above.

[9] Center for Urban Transportation Research (1999), *Mobility and Mode Choice of People of Color for Non-Work Travel*, draft report prepared for Battelle Memorial Institute, Columbus, Ohio.

The concepts of race and ethnicity used in this paper are based on self-identification of persons into one of several pre-determined racial and/or ethnic groups in their response to the NPTS or decennial census questions. Respondents do not have the option to indicate a multi-racial or multi-ethnic background. Racial groups are typically defined as White, Black, Asian (including Pacific Islanders), and a residual category identified as "Other Races." Ethnic groups are based on Hispanic origin: Hispanics and non-Hispanic. This paper uses a joint definition of race/ethnicity with analysis centering on Hispanic, non-Hispanic Whites, non-Hispanic Blacks, non-Hispanic Asians, and non-Hispanic Others (the last four groups will be referred to throughout the rest of this paper as White, Black, Asian, and Others).

The various racial and ethnic groups have and are anticipated to continue to follow different growth patterns. These different growth patterns are expected to change the composition of the U.S. population considerably in the next half-century. The 1990 U.S. population was composed of about 9.0 percent Hispanic, 75.9 percent White, 11.8 percent Black, 2.8 percent Asian, and 0.7 percent others. By 2050, the Hispanic share is expected to increase to 26.2 percent, the Asian share to 5.4 percent, and the residual group to 1.0 percent of the total population. On the other hand, the White and Black shares in the total population are expected to decline to 56.5 percent and 10.9 percent, respectively, by 2050.

Mobility

Americans were highly mobile in 1995, making 1,250 person trips per capita for non-work activities, almost three and a half trips per day (Figure 1). Whites exhibited higher mobility, about 2 percent over the national average, while mobility for people of color was lower. Among people of color, Hispanic mobility was the highest (about 2 percent below the national average) and Asian mobility was the lowest (about 15 percent below the national average).

Differences in average mobility for non-work travel among the racial and ethnic groups change

little with personal, household, and geographic characteristics. Table 1 shows relative mobility between each of the racial and ethnic groups and the national average number of person trips per capita for selected characteristics. For example, female mobility is 97 percent of the national female average for Hispanics, 103 percent for Whites, 91 percent for Blacks, 79 percent for Asians, and 95 percent for Others.

Another way of comparing mobility across the racial and ethnic groups is to look at the proportion of persons within each group who do not make any non-work trips on a given day. About 22 percent of the population nationwide did not make any non-work trips on a given day in 1995. The rates for Whites (21.4%) is below the nationwide rate, but the rates for Hispanics (22.9%), Blacks (24.5%), and Asians (24.3%) are higher.

Annual mobility per capita for non-work activities grew substantially from 1983 to 1995 for all racial and ethnic groups. This is true for all five measures of mobility used in this document: person trips, person miles, vehicle trips, vehicle miles, and person hours. Figure 2 shows annual mobility per capita for 1983, 1990, and 1995 by racial and ethnic background for three of the measures of mobility.[10]

Mobility grew at a much faster rate for people of color than for the white population during the period from 1983 to 1995. This is true for all five measures of mobility. Consider, for example, mobility in person trips per capita. The data from Figure 2, when analyzed in terms of rates of change for mobility, indicate that Hispanic mobility grew at a rate that is almost twice as high as that at which the national average grew while White mobility grew at a rate that is lower than that at which the national average grew. Among people of color, Hispanic mobility grew at the highest rate, followed by Blacks and other groups. Mobility for people of color not only grew at higher rates than mobility for the White population, but also increased more in absolute terms when mobility is measured with the number of person trips per capita.

[10] Asians are not separately identified as a group in trend discussions because the 1990 NPTS did not identify "Asian" as a separate race. The group "Others" includes Asians.

In looking at the distribution of the absolute changes in per capita mobility by trip purpose and by mode, most of the trip increases occur in the personal and family business categories and in the privately driven auto mode category. The share of changes for personal and family business is over 81 percent for Whites and 67 percent, 77 percent, and 72 percent for Hispanics, Blacks, and Others, respectively. The share of changes as drivers is over 92 percent for Whites and 66 percent, 82 percent, and 67 percent for Hispanics, Blacks, and Others, respectively.

Mobility for the White population was higher than the national average throughout the period from 1983 to 1995, while mobility for people of color was lower than the national average. On the other hand, the faster growth in mobility for people of color reduced disparities in mobility among the racial and ethnic groups during the period from 1983 to 1995. This is true for all five measures of mobility used in this document (Figure 3). Mobility for the White population declined slightly relative to the national average, while mobility for people of color increased dramatically relative to the national average in most cases.

A number of factors that changed differently across the racial and ethnic groups may help explain the observed differences in the mobility trends across these groups. Several were considered including trip characteristics, personal characteristics, household characteristics, and geographic characteristics. The following was determined to be significant

Trip Characteristics - Average trip distance increased over 20 percent for people of color, while it decreased slightly for Whites. On the other hand, average trip duration decreased for Whites, Blacks, and Others, while it increased for Hispanics. Average speed increased more for people of color than for Whites. These differences in the changes in trip characteristics may help explain the differences in the growth patterns across the different measures of mobility .

Vehicle Ownership - The proportion of people living in households without vehicles declined for every racial and ethnic group during the period from 1983 to 1995 (Figure 4, top graph). However, the absolute number of people living in households without vehicles declined for Whites and Blacks, but

slightly increased for Hispanics and Others (Figure 4, second graph).

Mode Choice for Non-work Travel

This section examines how modal differences across racial and ethnic groups may vary with personal, household, geographic, and trip characteristics.

For all racial and ethnic groups combined, privately-operated vehicles have a dominant role in non-work travel (Table 2). Driving privately-operated vehicles accounts for 57.3 percent and riding in privately-operated vehicles as passengers accounts for 31.2 percent of all person trips for non-work travel. Modes other than privately-operated vehicles have minimal roles in non-work travel, with walking accounting for 6.4 percent, public transit for 1.4 percent, bicycling for 1.0 percent, and other means for 2.7 percent.

Across the racial and ethnic groups, several patterns of modal difference emerge. The largest differences in relative modal shares between people of color and Whites occur with trips made by public transit and walking. People of color are several times as likely as Whites to use public transit for non-work travel and about twice as likely as Whites to walk for non-work travel. Blacks stand out among people of color in their use of public transit and other means. Blacks are over 9 times as likely as Whites to use public transit for non-work travel, while other people of color are about 2-4 times as likely as Whites to use public transit for non-work travel. Blacks are 1.6 times as likely as Whites to use the residual modes for non-work travel, while other people of color are about as likely as Whites to use those modes. While all people of color are less likely to drive for non-work travel than Whites, the extent of difference is larger for Hispanics and Blacks than for other people of color. All people of color are more likely than Whites to walk for non-work travel, with the extent of difference being larger for Blacks and Asians than for other people of color. Hispanics are more likely than Whites to travel as passengers in privately-operated

vehicles. Overall, Blacks differ the most from Whites in mode choice for non-work travel, followed by Hispanics, Asians, and Others.

In looking at temporal trends, every racial and ethnic group experienced decreases in shares of non-work person trips made as passengers of privately-operated vehicles, by transit, by walking, and by other means (Figure 5). Decreases in shares of non-work person trips made as passengers of privately-operated vehicles and by walking are similar across the racial and ethnic groups. The decreases range from 20 to 29 percent for trips made as passengers of privately-operated vehicles and from 35 to 42 percent by walking. Shares of person trips made by transit decreased almost by half for Hispanics, 32 percent for Whites, 24 percent for Blacks, and 59 percent for Others. Shares of person trips by walking, however, decreased less for Hispanics than for other groups. The differences in modal distributions among the racial and ethnic groups, based on the sum of the difference between groups, also decreased between 1983 and 1995.

Cross tabulations were performed to determine how mode choice across racial/ethnic segments varied when other variables were considered. Among the variables for which distributions were calculated were: person age, gender, employment status, driver's license status, household income, vehicle ownership, household lifecycle, area size, urban classification, trip purpose, trip distance, and, time of day. Space does not permit a presentation of the detailed results of these analyses in this paper.

License Status and Vehicle Ownership

Modal differences across racial and ethnic groups are minimal among several segments of the population, including people with at least two household vehicles, licensed drivers, workers, and people living in households with high incomes. For licensed drivers, modal differences are small for a variety of characteristics besides vehicle ownership, employment status, and household income. The one exception to this result seems to be among people who live in households without any vehicle. Regardless of license status, the modal difference among people without household vehicles is high, indicating significant

differences in modal distributions across the racial and ethnic groups. On the other hand, modal differences are significant for non-licensed drivers among people living in households with at least two vehicles, workers, or people living in households with an annual income at least $50,000. This evidence supports the hypothesis that modal distributions differ across racial and ethnic groups mainly because of modal differences among non-licensed drivers and people without household vehicles. To see the size of the population segment of non-licensed drivers and people without household vehicles, Table 3 shows population distribution by license status and vehicle ownership for each of the racial and ethnic groups and for two population universes. For all racial and ethnic groups combined, non-licensed drivers and people without any household vehicles account for 13 percent of the population age 16 or older and for 28 percent of the population age 5 or older. These shares differ among the racial and ethnic groups. On one extreme, this population segment accounts for 9 percent of people age 16 or older and for 24 percent of people age 5 or older among Whites. On the other extreme, this population segment accounts for 32 percent of people age 16 or older and for 46 percent of people age 5 or older among Blacks.

Table 4 shows non-work person trip modal distributions for each racial and ethnic group by person age, driver's license status, and vehicle ownership. Public transit and walking play a significant role in meeting the non-work travel needs of non-licensed drivers or people without household vehicles, accounting for 11.7 percent and 23.5 percent of trips, respectively. In contrast, these two modes account for 0.4 percent and 3.6 percent of trips for drivers with vehicles. However, privately-operated vehicles still account for more than half of the non-work travel for non-licensed drivers or people without household vehicles.

Among drivers with household vehicles, modal distributions are remarkably similar. The two notable differences are that Blacks still make more trips proportionally by public transit (1.3 percent vs. 0.3-0.6 percent) and that Asians walk proportionally more for their non-work travel (7.6 percent vs. 3.4-5.4 percent).

Among non-licensed drivers or people without household vehicles, the differences in modal distributions are large. However, most differences are qualitatively similar to the general pattern of difference observed at the aggregate level. One notable exception is that Asians and Others, not Hispanics and Blacks, travel proportionally less frequently than other groups as drivers of privately-operated vehicles. Also, it is Whites, not Hispanics, that have the highest share of non-work trips made as passengers of privately-operated vehicles.

Role of Racial and Ethnic Background in Transit Use

One powerful tool to delineate the role of racial and ethnic background on mode choice is regression analysis. Regression analysis is a set of statistical methods that allows one to measure the effects of racial and ethnic background on mode choice, while controlling many other variables that may also affect mode choice. In contrast, cross tabulations becomes intractable when there are more than two controlling variables. This section uses logistic regression, a particular method of regression analysis, to examine the role of racial and ethnic background on whether public transit was used by respondents on their travel day.

Logistic regression is used in this analysis because the variable to be explained, i.e., whether public transit was used, takes only two values. It takes the value 1 if a respondent used public transit on the travel day and zero otherwise. The commonly used method of linear regression may be used when the variable to be explained can take any value in a given range. Annual miles driven per driver, for example, can take any non-negative value.

Three sets of hypotheses were tested in this section. They relate to whether each group of people of color differs from Whites in using public transit for non-work travel among three population segments: the mobile population, the immobile population, and the young population. The mobile population includes

all people who are at least 16 years old, licensed to drive, and live in households with at least one vehicle. The immobile population includes all people who are at least 16 years old and are not licensed to drive or people who are at least 16 years old and live in households without vehicles. The young population includes all people who are under 16 years old. The role of racial and ethnic background in the use of public transit for non-work travel is separately tested for these population segments because the analysis earlier suggests that modal differences between people of color and Whites differ across these population segments. For a given population segment, four hypotheses are tested, one for each group of people of color.

Four sets of additional variables are used to control for effects of factors other than racial and ethnic background on transit use for non-work travel. The set including age, driver's license status, and vehicle ownership has three dummy variables: Mobile, Immobile, and Young. These three variables are used to determine which of the three sets of hypotheses is being tested. If a model includes Immobile and Young as two variables and interacts Mobile with the racial and ethnic variables, it will be used to test the hypotheses related to the Mobile population. Models for the other two population segments can be similarly constructed.

When people of color are tested against Whites regarding transit use for non-work travel, the other three sets of variables are used to control how similar they are in factors other than race and ethnicity. The geographic characteristics include area scale, area density, proximity to transit stops, and whether one lives in the New York area. The personal and household characteristics other than age, license status, or vehicle ownership includes education attainment, employment status, household life cycle, and household income. The travel day characteristics include whether the travel day was on a weekend and whether the travel day was in December, January, or February.

The regression analysis uses a sample of persons from the 1995 NPTS who satisfy three conditions: 1) they made at least one person trip on their travel day; 2) they indicated that public transit

was available in the city or town in which they resided; and 3) they had valid values for all variables included in the analysis.

Results

For the mobile population, both Hispanics and Blacks are statistically different from Whites in whether they use public transit for non-work travel when they can be different in their geographical characteristics. However, only Blacks are statistically different from Whites when they are identical in geographic characteristics. Excluding the dummy for New York MSA does not change the results.

The results for the immobile population are the same as those for the mobile population when the racial and ethnic groups are controlled to be identical in geographical characteristics. That is, only Blacks are statistically different from Whites. Excluding the dummy for New York MSA does not change the results. When the racial and ethnic groups can be different in geographical characteristics, however, the results for the immobile population differ from those for the mobile population. If the personal and household characteristics are controlled to be identical between people of color and Whites, all four groups of people of color are different from Whites in whether using public transit for non-work travel. If the personal and household characteristics can be different as well, all but Asians are different from Whites.

The overall results for the young population are identical to those for the mobile population. That is, both Hispanics and Blacks are statistically different from Whites in whether they use public transit for non-work travel when they can be different in their geographical characteristics. However, only Blacks are statistically different from Whites when they are identical in geographic characteristics. Excluding the dummy for New York MSA does not change the results.

Thus, when characteristics other than racial and ethnic background are appropriately controlled, only Blacks differ from Whites in whether public transit is used for non-work travel.

Mode Choice for Work and Non-work Travel: A Comparison

One might reasonably question whether or not observations about mode choice for non-work travel for different racial and ethnic groups carry over to behaviors for work travel. While this study did not explore that issue in detail, Table 5 provides a brief overview of work versus non-work travel for each of the racial and ethnic groups and all groups combined by trip purpose (work vs. non-work) and by year (1983 vs. 1995). Only people age 16 or older are included in the tabulation. Driving and public transit play a larger role in work travel than in non-work travel, while the other modes play a larger role in non-work travel. These modal differences between work and non-work travel declined from 1983 to 1995 for trips made as drivers of privately-operated vehicles, as passengers of privately-operated vehicles, by public transit, and by walking, but increased for trips by bicycle and by other means.

The role of driving increased for both work and non-work travel from 1983 to 1995, while the roles of riding in privately-operated vehicles as passengers, public transit, and walking decreased for both work and non-work travel during the same period. The increase in the role of driving is larger for non-work travel than for work travel, while the decreases in the roles of riding privately-operated vehicles as passengers, public transit, and walking are smaller for non-work travel than for work travel.

Modal differences between work and non-work travel vary across racial and ethnic groups for several modes. While driving plays a larger role in work travel than in non-work travel for all racial and ethnic groups, that role is relatively smaller for Blacks than for the other groups. In addition, the differences for public transit are largest among Whites and smallest among Hispanics. Whites are almost four times as likely to use public transit for work travel as for non-work travel, while Hispanics are about twice as likely to use public transit for work travel as for non-work travel. Also, walking plays a relatively larger role in work travel for Whites than for any people of color group.

Changes in modal shares from 1983 to 1995 generally are in the same direction for work and non-

work travel for each of the racial and ethnic groups. The magnitude of changes, however, differs somewhat between work and non-work travel. For the modes whose share increased during the period, including driving only, the increase is larger for non-work travel than for work travel for all groups. For the modes whose share decreased during the period, including riding privately-operated vehicles as passengers, public transit, and walking, the decrease is typically smaller for non-work travel than for work travel. While public transit plays a larger role in both work and non-work travel for people of color than for Whites, the relative role of public transit between people of color and Whites is even bigger in non-work travel than in work travel.

Findings and Observations

The NPTS provides a rich data source that sheds a great deal of light on both current travel behavior and changes in behavior over time. While limited sample sizes for some of the sub-segments of the population and changes in survey methodology over time require one to exercise caution in interpreting results, nonetheless, one can draw several well supported conclusions from the data that are important to transportation planning. The analysis underlying this paper provided a rich description of non-work travel behavior for the racial/ethnic population segments investigated. Mobility for racial/ethnic population segments has improved dramatically over the past few decades to the point where it is nearly the same as for the White population. Not surprisingly, the changes in mobility are accompanied by, or enabled by, changes in the population characteristics that have long been acknowledged as key contributors to mobility. As the income levels, auto ownership levels, and licensure levels move to more closely match those of the White population, so too have the indicators of mobility changed to more closely compare with that of the national means and the White population. What is most surprising is the magnitude of the changes that have occurred.

People of Color and Mobility

The share of the population comprised of people of color is expected to grow at a much higher rate than the White population's share and is expected to reach 43.5 percent of the total population by 2050. Mobility is significant to all of us and especially to people of color. Historically, this segment of the population has had lower mobility, at least partially explained by the fact that this population exhibits other traits that are related to mobility such as lower household income, lower average age, lower auto ownership, lower licensure levels, and being more highly concentrated in urbanized areas. While people of color continue to have a lower level of per capita mobility than Whites and make a smaller share of non-work trips as drivers of privately-operated vehicles, they have experienced larger increases than Whites in per capita mobility and in the share of non-work trips as drivers of privately-operated vehicles. These relatively larger changes in per capita mobility by people of color are coincident with large declines in the proportion of minority persons who are not licensed to drive, who live in households without a licensed driver, or who live in households without any vehicles.

Mode Choice at the Aggregate Level

There are several distinctive patterns of difference in mode choice among the racial and ethnic groups. First, the largest differences in relative modal shares between people of color and Whites occur for trips by public transit and walking. People of color are several times as likely as Whites to use public transit for non-work travel and about twice as likely as Whites to walk for non-work travel. Blacks stand out among people of color in their use of public transit. Blacks are over 9 times as likely as Whites to use public transit for non-work travel, while other people of color are about 2-4 times as likely as Whites to use public transit for non-work travel.

While all people of color are less likely to drive for non-work travel than Whites, the extent of difference is larger for Hispanics and Blacks than for other people of color. While all people of color are

more likely than Whites to walk for non-work travel, the extent of difference is larger for Blacks and Asians than other people of color. Other people of color are about equally as likely as Whites to travel as passengers of privately-operated vehicles for non-work travel; Hispanics are more likely than Whites to travel as passengers.

Modal Differences by Market Segments

Differences in mode choice across the racial and ethnic groups vary little with certain market segments but dramatically with others. First, metropolitan area size, area density, or trip purpose do not seem to have systematic effects on modal differences across the racial and ethnic groups. Second, modal differences across the groups are slightly smaller among people age 16-64 than for other age cohorts, among males than for females, among people living in households with at least two adults than for people living in one-adult households, among trips 1-20 miles long than for other trips, and among night trips than for other trips. Third, modal differences across the racial and ethnic groups are much smaller among people with at least two household vehicles than for people with fewer vehicles, among workers than for non-workers, among people with high incomes than for people with lower incomes, and among people who are licensed to drive than for people not licensed to drive. Fourth, mode choice across the racial and ethnic groups is remarkably similar among people who are licensed to drive and live in households with vehicles. Modal differences are large, on the other hand, among people who are not licensed to drive or live in households without vehicles, especially those who are 16 years or older.

Role of Racial and Ethnic Background in Transit Use

Racial and ethnic background appears to play a role in whether public transit is used on a typical day for non-work travel. When the racial and ethnic groups are controlled to be identical in a number of personal, household, geographic, and trip characteristics, only Blacks are found to be different from Whites

in whether public transit was used for non-work travel on the travel day. This is true among people who are licensed to drive and live in households with vehicles, among people 16 years or older who are not licensed to drive or live in households without vehicles, and among people under 16 years old.

Implications

The data indicate that, to the extent that the economic and household characteristics of racial/ethnic group populations are moving to more closely approximate those of the White population, so too is travel behavior moving to more closely match that of the White population. Racial/ethnic group traits critical to travel behavior are moving quite rapidly (perhaps more rapidly than might be the case for pure economic characteristics of households) to match those of the White population. Perhaps with the exception of some cultural characteristics such as an apparent greater willingness to use transit by Blacks, there is overwhelming evidence of a trend toward more comparable mobility levels across population segments. While there remain some differences in behavior that are not explained by looking at other available variables, it is not clear that even these differences will be retained over the long term. Most obviously, the willingness of Blacks to use public transportation even when other characteristics of the population are held constant may be explained by Blacks having a greater awareness of transit options, living in areas with better service available, and/or a lack of stigma associated with transit use -- conditions that may or may not remain over time.

Auto-mobility is clearly spreading to more and more segments of the population. The young, the old, the unemployed, the low income, and various minority racial/ethnic groups are all evidencing greater availability of auto travel options and lessened dependency on transit and other modes. As SOV options become available there is a strong trend towards greater auto use. This trend is certainly not unique to the minority populations, however, it may be more evident in those population segments as the rates of change in those population groups have been faster than for the overall population.

One is tempted and perhaps obligated to speculate on the implications of historic trends and on how these might play out in the future. Logical questions include speculations as to whether the equalization of mobility among groups will continue and, perhaps result in the mobility levels of some ethnic/racial groups actual exceeding mobility for Whites. One might, for example, argue that the job housing imbalance could create greater overall travel demand for minorities highly concentrated in central cities if job growth continued in outlying areas and if resources did not constrain their ability to make longer trips to jobs, shopping, or other purposes concentrated in distant suburbs. Similarly, one wonders whether overall mobility levels are near saturation where most latent demand has been satisfied and future growth in demand will be limited to more modest increases as economic conditions slowly decrease the relatively small share of the population that has constraints on their mobility. Is growth in overall mobility now limited by time rather than income constraints as the vast majority of the population has moved into the auto-available household categories? Might an economic downturn reverse some of the trends apparent in the data? Could roadway congestion dampen the longer term growth in overall travel demand and perhaps create differential mobility levels among population groups driven by modal levels of service in particular geographies rather than by household characteristics?

One might also want to speculate as to whether or not investment plans or other policies might influence the travel choices of the racial/ethnic groups disproportionately in the future. Will the recent increases in transportation funding and the relatively strong growth of funding for non-SOV modes result in greater equalization of travel behavior or perhaps widen the gap as the relative performance of travel options changes differently for different groups? For example, will increased funding for transit result in better transit service in the more urban areas that are the location of the vast majority of minority group persons, thus perhaps reversing or slowing the shift to auto relative to White persons, or will transit investment targeted to choice riders and suburban populations make stronger inroads in shifting white travelers toward higher transit mode shares?

While there remains unknowns, there are some clear and important implications of the observed trends and information provided by the 1995 NPTS data regarding mode choice for different racial/ethnic groups. Differences among racial/ethnic groups are small and narrowing and household characteristics are more powerful and more logically causal determinants in understanding travel choice for non-work trip making.

Table 1. Ratio of Average Mobility for Non-Work Travel between Racial and Ethnic Groups and All Groups Combined, 1995

Selected Population Segments	Hispanic	Non-Hispanic			
		White	Black	Asian	Others
Age 65 Or Older	0.80	1.05	0.71	0.83	1.00
Female	0.97	1.03	0.91	0.79	0.95
Less Than High School Graduate	0.97	1.05	0.88	0.71	0.93
Non-Driver	1.05	0.99	0.98	0.88	1.03
Living In Three-Person Households	0.98	1.02	0.95	0.85	1.02
Single Adults With Children Under 5	0.99	1.03	0.97	0.88	1.02
Household Income $10,000-$14,999	0.96	1.01	1.00	1.07	1.08
Renter	0.95	1.04	0.94	0.92	0.99
Living In Zero-Vehicle Households	1.00	1.04	0.97	0.91	0.80
Urban Areas	0.95	1.08	0.93	0.91	0.91
MSA 3,000,000+	0.94	1.05	0.91	0.83	0.89
Nationwide	0.98	1.02	0.92	0.85	0.95

Source: Travel Day File, 1995 NPTS.

Table 2. Modal Distribution of Person Trips for Non-Work Travel, 1995

Mode	Hispanic	Non-Hispanic				All
		White	Black	Asian	Others	
POV Driver (%)	49.8	59.6	48.9	55.0	55.2	57.3
POV Passenger (%)	34.1	31.1	29.6	28.8	30.8	31.2
Public Transit (%)	2.6	0.6	5.8	2.4	1.5	1.4
Bicycle (%)	1.0	1.1	1.0	0.7	1.3	1.0
Walk (%)	9.8	5.1	10.6	10.8	8.9	6.4
Others (%)	2.7	2.5	4.1	2.2	2.4	2.7
Total (%)	100	100	100	100	100	100
Group Size	10	75	11	2	2	100

Source: Travel Day File, 1995 NPTS.

Table 3. Population Distribution by License Status and Vehicle Ownership, 1995

Racial and Ethnic Groups	Population Age 16 or Older		Population Age 5 or Older	
	Drivers in Households with Vehicles	Non-Drivers or Drivers in Households without Vehicles	Drivers in Households with Vehicles	Non-Drivers or Drivers in Households without Vehicles
Hispanic	77	23	59	41
White	91	9	76	24
Black	68	32	54	46
Asian	83	17	70	30
Others	85	15	70	30
All	87	13	72	28

Source: Person File, 1995 NPTS.

Table 4. Modal Distribution of Person Trips for Non-Work Travel by Person Age, License Status, and Vehicle Ownership, 1995

Age	License Status and Vehicle Ownership	Mode	Hispanic	Non-Hispanic				Total
				White	Black	Asian	Others	
16 or Older	Drivers in Households with Vehicles	POV Driver	75.9	76.7	77.7	75.2	74.7	76.6
		POV Passenger	18.5	18.9	16.8	16.1	19.1	18.6
		Public Transit	0.5	0.3	1.3	0.6	0.4	0.4
		Bicycle	0.3	0.3	0.1	0.1	0.1	0.3
		Walk	4.3	3.4	3.6	7.6	5.4	3.6
		Others	0.5	0.5	0.5	0.3	0.3	0.5
		Total	100.0	100.0	100.0	100.0	100.0	100.0
		Segment Size	63	77	60	72	73	73
	Non-Drivers or Drivers in Households without Vehicles	POV Driver	8.5	8.7	8.2	2.8	3.6	8.2
		POV Passenger	45.5	58.5	37.6	49.7	55.6	50.7
		Public Transit	14.1	6.0	20.8	16.4	11.6	11.7
		Bicycle	0.9	2.6	1.9	0.9	1.4	2.0
		Walk	28.1	20.2	27.1	27.6	24.2	23.5
		Others	2.8	4.0	4.4	2.5	3.6	3.8
		Total	100.0	100.0	100.0	100.0	100.0	100.0
		Segment Size	13	5	19	10	9	8
Under 16		POV Driver	1.3	3.6	1.1	0.5	1.1	3.0
		POV Passenger	70.7	73.5	59.4	70.2	66.7	71.2
		Public Transit	2.1	0.7	5.8	2.0	1.0	1.5
		Bicycle	2.7	3.7	3.0	3.0	5.5	3.5
		Walk	14.6	8.4	16.8	14.4	15.1	10.4
		Others	8.6	10.1	13.9	9.9	10.5	10.4
		Total	100.0	100.0	100.0	100.0	100.0	100.0
		Segment Size	24	18	21	18	18	19
Group Size			10	75	11	2	2	100

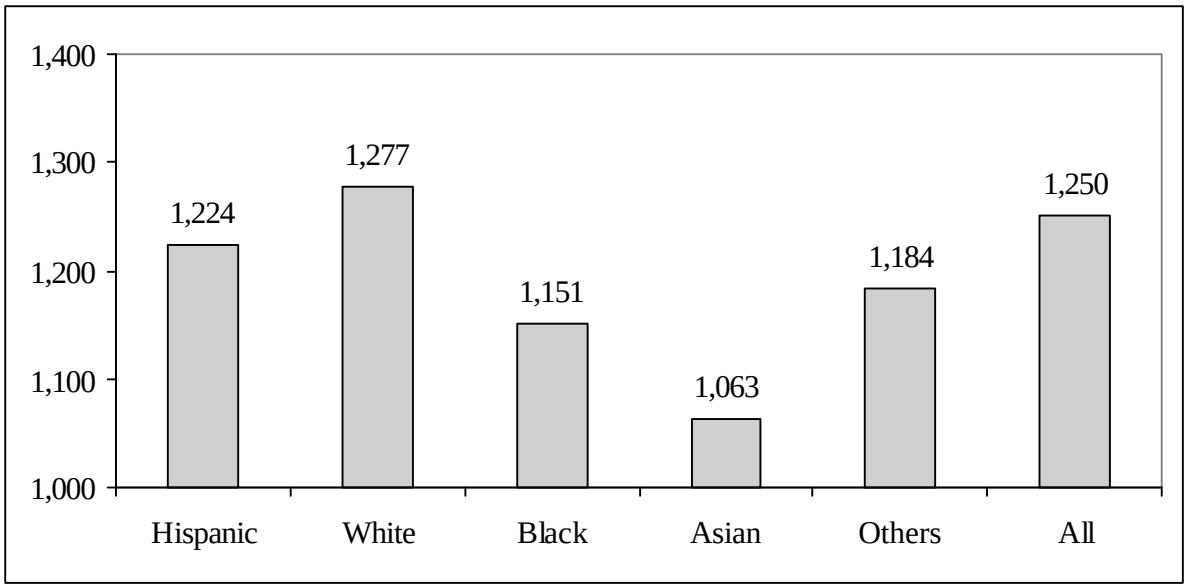
Source: Travel Day File, 1995 NPTS.

Table 5. Mode Choice by People Age 16 or Older by Purpose, 1983 and 1995

Pur-pose	Mode	1983					1995				
		Hispanic	White	Black	Others	All	Hispanic	White	Black	Others	All
Non-Work	POV Drivers	41.2	51.1	38.5	44.6	49.5	64.4	72.6	61.7	66.8	70.4
	POV Passengers	38.7	37.5	34.2	37.7	37.5	23.1	21.3	21.6	21.7	21.5
	Transit	4.3	0.8	6.8	3.9	1.4	2.8	0.6	5.8	2.0	1.4
	Bicycle	0.6	0.7	0.4	1.3	0.7	0.4	0.4	0.5	0.2	0.4
	Walking	14.4	8.7	18.1	12.3	9.6	8.4	4.4	9.0	8.6	5.4
	Others	0.8	1.2	2.0	0.2	1.2	0.9	0.7	1.4	0.6	0.8
	Total	100	100	100	100	100	100	100	100	100	100
Work	POV Drivers	60.5	75.2	51.5	64.8	72.5	77.4	86.8	72.5	79.5	84.1
	POV Passengers	24.7	15.8	21.5	19.7	16.9	10.9	7.9	11.4	10.9	8.7
	Transit	8.3	2.8	17.9	11.1	4.5	5.5	1.8	11.6	5.2	3.3
	Bicycle	0.4	0.4	0.2	0.0	0.4	0.3	0.4	0.2	0.7	0.4
	Walking	5.7	5.1	7.6	4.4	5.2	3.8	1.9	3.0	3.2	2.3
	Others	0.4	0.6	1.3	0.0	0.6	2.1	1.3	1.5	0.5	1.3
	Total	100	100	100	100	100	100	100	100	100	100

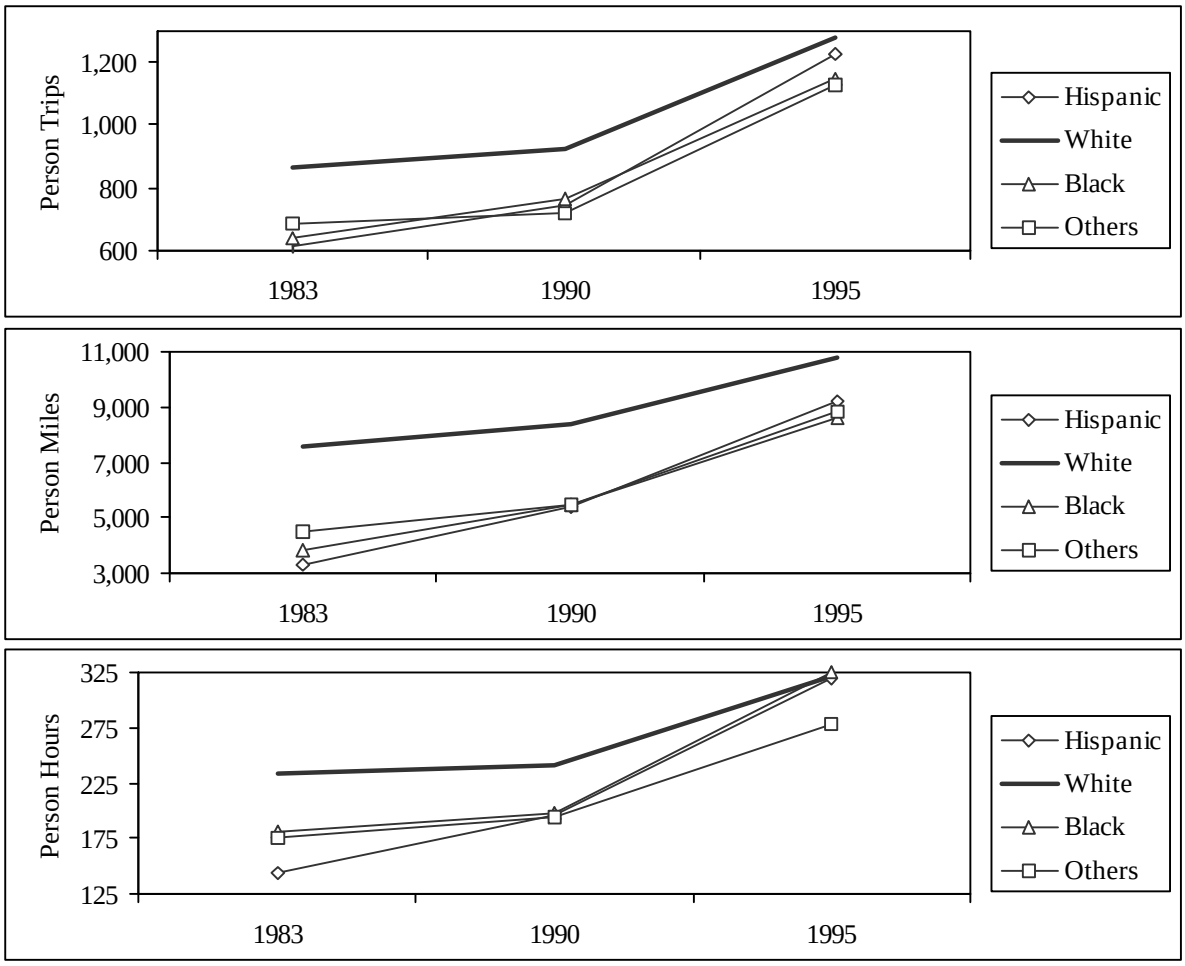
Source: 1983 and 1995 NPTS

Figure 1. Average Annual Person Trips per Capita for Non-Work Travel, 1995



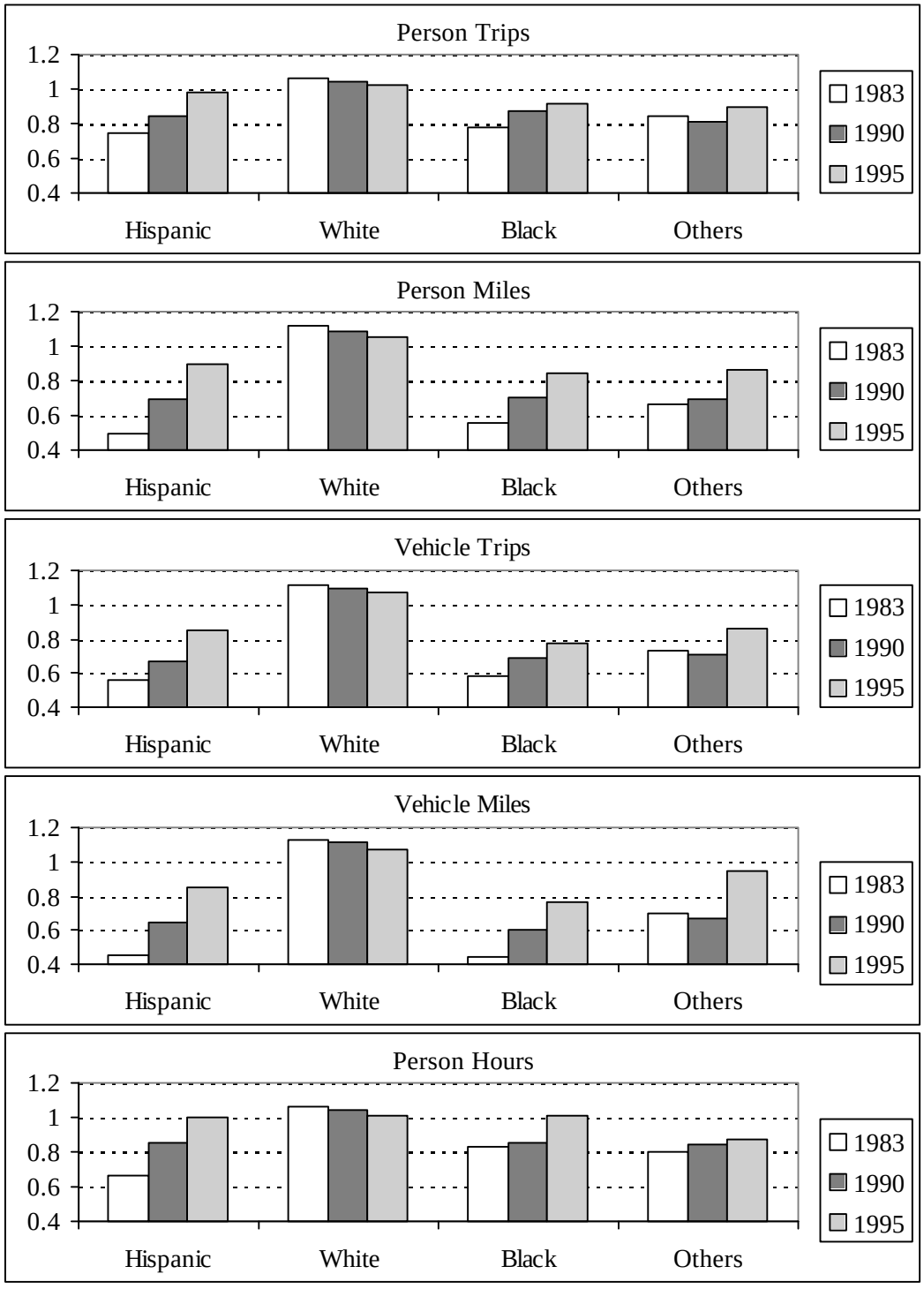
Source: Travel Day File, 1995 NPTS.

Figure 2. Trends in Annual Mobility per Capita for Non-Work Activities, 1983-1995



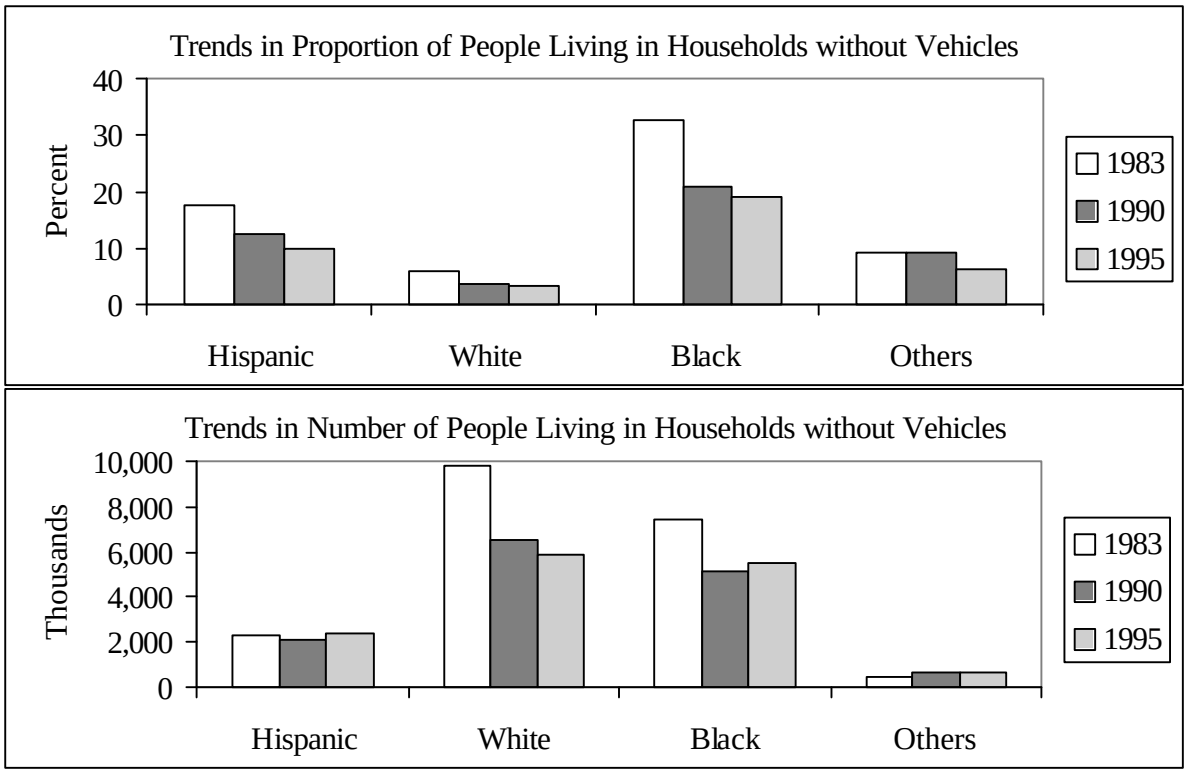
Source: 1983, 1990, and 1995 NPTS.

Figure 3. Ratio of Per Capita Mobility for Non-Work Activities between Racial and Ethnic Groups and All Groups Combined, 1983-1995



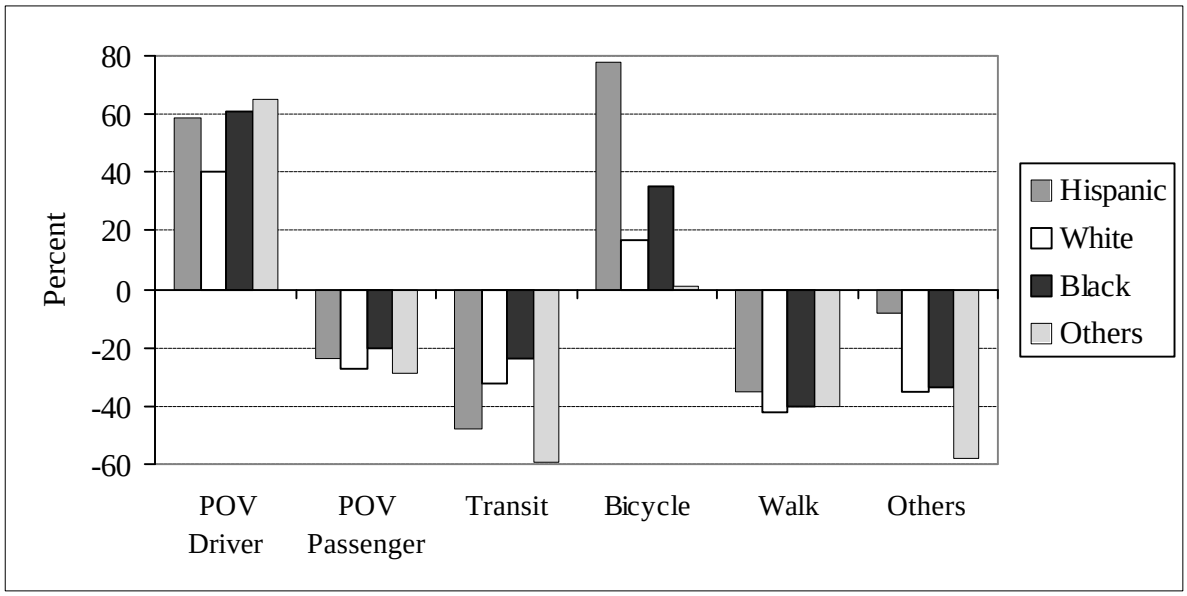
Source: 1983, 1990, and 1995 NPTS.

Figure 4. People Living in Households without Vehicles, 1983-1995



Source: 1983, 1990, and 1995 NPTS.

Figure 5. Change in Modal Shares between 1983 and 1995 for Non-Work Travel



Source: 1983 and 1995 NPTS.